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Rhodora

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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

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TWO WEEKS IN SOUTHWESTERN NOVA SCOTIA

C. A. Weatherby

Stimulated by our chance finding of *Lachnanthes* in 1940, my wife and I returned to Nova Scotia for part of August, 1941. We established ourselves at Mill Village, on the lower Medway River, Queens County, selecting that region because the Medway valley abounds in lakes and had not been visited by the Gray Herbarium expeditions of 1920 and 1921. We chose our headquarters happily; our landlady, Mrs. F. Laurie Mack, not only provided us with comfortable lodgings, well suited for botanical work, and excellent food, but was interested in our activities and most helpful in securing for us needed information.

We attempted no strenuous excursions and made no general collections, taking only plants as to the identity of which we were in doubt or which seemed likely, from Prof. Fernald's reports of 1921 and 1922 (in Rhodora, vols. 23 and 24), to be of some geographic interest. Using the car, we scouted along the coast from Liverpool to Bridgewater, followed the Medway from the sea to Ponhook Lake, and visited the more accessible lakes along route 8 from Liverpool to South Brookfield, plus several of those to the east of the Medway. In this area and on the basis noted above, we secured 68 selected numbers.

The whole area visited is in what Goldthwait (Physiography of Nova Scotia, Can. Geol. Surv. Mem. 140 (1924)) calls the southern upland. It is not high, however—Ponhook Lake is 226 ft. above sea-level—and in the Medway valley has no bold relief, though eastward in Lunenburg County the hills become higher and more rugged. The underlying rocks are the folded slates and quartzites of the gold-bearing series.

Where not cleared for cultivation, the region is covered with a mixed forest of spruce, fir, hemlock, white pine, beech, birch, red maple and red oak (*Quercus borealis*). There is one barren occupied by a sparse stand of red pine with a dense ground-cover of *Arctostaphylos* and *Corema*. A considerable area on route 8, north of Middlefield, supports a nearly pure stand of red oak with an undergrowth of huckleberry, witch hazel, *Viburnum cassinoides* and the like. The deep hollows are, of course, occupied by lakes; the shallower by black-spruce bogs or sometimes by grassy swales where wild hay is often cut by farmers living nearby. We saw no raised bogs like those of eastern Maine. Rich woods are almost entirely absent; one small bit is to be found near Cameron Lake. In the immediate vicinity of the sea the vegetation becomes more boreal; the proportion of spruce in the forest increases notably and such plants as *Vaccinium Vitis-idaea* var. *minus* and *Empetrum nigrum* appear on exposed banks and ledges. As on Cape Cod, the best botanizing is to be found on lake-margins, which here are gravelly, pebbly, rocky or covered with peat. Our investigation of such habitats was more or less interfered with by heavy rains which raised considerably the water-level of streams and the smaller lakes. Fortunately, the larger lakes were not much affected; their strand-floras remained accessible and in reasonably good condition.

As would be expected, the flora of the Medway valley conforms closely to the botanical picture of the western counties drawn in Fernald's reports; but in some details it seems to differ. We did not see *Schizaea;* that tiny plant, however, we might have overlooked. But we should not have overlooked *Polystichum acrostichoides*, which Fernald states the Gray Herbarium botanists saw wherever they went, but which we did not find at all. Such southern and coastal species as *Woodwardia areolata* and *Sabatia Kennedyana* are apparently absent. *Habenaria blepharиglottis*, reported by Fernald as abundant in Yarmouth County, we saw only once and that, appropriately, in the vicinity of our first station for *Lachnanthes*. On the other hand, as the list which follows will show, the Medway valley harbors some species, for the most part also of southern affinity, not yet found to the west or east.

In addition to our own collections, we had the privilege of examining an excellent little herbarium prepared by Mr. P. V. Wessman of Liverpool. His records, so far as they are noteworthy, are included in the appended list. Mr. A. E. Roland, the Provincial Botanist, has very kindly furnished helpful data of distribution, drawn from his own field-work and from specimens in the herbarium of the Nova Scotia Department of Agriculture at Truro and in the Canadian National Herbarium. To both these gentlemen, our thanks are due.

Our list follows the plan of Prof. Fernald's reports, to which it is a modest supplement. Introduced species are in italics. Species new to Nova Scotia are indicated by a single asterisk, those new to Canada by two. Place of publication is given for names not in current manuals. Localities are in Queens County unless otherwise indicated. Local extensions of range and even new stations have been rather freely included in the hope that such records may be useful to Canadian botanists who are studying the distribution of Nova Scotian plants in detail. Numbers, unless otherwise noted, are our collection-numbers.

SCHEUCHZERIA PALUSTRIS L., var. AMERICANA Fernald, in RHODORA xxv. 178 (1923). Wet, sphagnous swale, Moosehorn Lake (7094). Recorded by Fernald from Shelburne Co. only; Roland reports it from Lily Lake, Centreville, Kings Co. Apparently not common in western Nova Scotia.

DISTICHLIS SPICATA (L.) Greene. Upper border of salt marsh, Indian Cove (7086). Since there seem to be few, if any, collections of this species from the south coast, this station is perhaps worth recording.

ORYZOPSIS PUNGENS (Torr.) Hitchc. Small clumps among dense carpets of bearberry, dry barren east of Greenfield (7084). Recorded by Fernald as characteristic of barrens in Shelburne and Lunenburg Cos.

** PANICUM LONGIFOLIUM Torr. Stony strand of Second Christopher Lake (7095).

This material, with open panicle, spikelets rarely more than 2.6 mm. long, second glume equalling the sterile lemma, and indurated lemma (hardly yet in the caryopsis stage) 0.6 mm. wide, seems clearly referable to typical *P. longifolium* as defined by Fernald (RHODORA xxiii. 193). Specimens from First Christopher Lake (7072), though rather young, seem also to belong here.

Eleocharis obtusa (Willd.) Schult. Submersed by high water, strand of Long Lake, between Buckfield and Waterloo, Lunenburg Co. (7107). Not seen elsewhere and apparently infrequent in this part of Nova Scotia, though common enough in the central and eastern portions of the province.

** Scirpus Longii Fernald in Rhodora xiii. 6 (1911). Peaty marsh, shore of Ponhook Lake (7116). One battered individual, probably of this species, at Moosehorn Lake. Hitherto known only from southern New Jersey, eastern Massachusetts and at a single station in Central Connecticut.

Carex vulpinoidea Michx. A few stools in moist ground in an abandoned sawmill clearing, Lake Rossignol Reservoir (formerly Sixteen-mile Lake) (7099). Reported by Fernald from Annapolis Co.; not otherwise known from Nova Scotia.

Carex lenticularis Michx. var. Blakei Dewey. Stony strand of First Christopher Lake, South Brookfield (7069). Probably also along the Medway River. Recorded by Fernald from Lunenburg Co. only.

Carex crinita Lam. var. minor Boott. On the pebbly and mucky strand of Cameron Lake and on other lake-shores. Spikes ascending or spreading, short-peduncled, more or less aggregated at the summit of the culm and not over 3.5 cm. long; the scales short for the species, not exceeding the upper perigynia and commonly less than twice as long as the lower. From the material at hand, this appears to be the prevailing, if not the only, phase of the species in Nova Scotia. It is apparently not common in the western counties.

Carex arctata Boott. Shaded bank above Beartrap Lake (7058). Apparently frequent in rich woods in eastern Nova Scotia and in the north as far west as Digby Co.; not reported from the southwestern counties.

Smilax rotundifolia L. Thickets at several points along the Medway River (7102) and shores of Ponhook Lake near the outlet. Reported by Mackay (Proc. Trans. Nova Scotia Inst. Sci. xi. pt. 2, 287 (1906)) from Yarmouth Co. and by Fernald from Digby and Shelburne Cos.

Lachnanthes tinctoria (Walt.) Ell. In Rhodora xliii. 36 (Jan., 1941), I reported this species from the shores of Ponhook Lake. From the Highway Department map which I was then using, the body of water in question appeared to be only an arm of that lake. A more detailed map and some enquiries, however, show that, though connected with Ponhook, it is regarded as distinct and goes by the name of Beartrap Lake.

At the original station, there were only about a dozen individuals of *Lachnanthes*. This year a similarly small station was found on the veritable shore of Ponhook Lake near the mouth of Kedron Brook, and a third, much larger, in a peaty marsh by the lake-shore farther west (7117)—the same in which *Scirpus Longii* was found. Here there were scores of plants, though only a few had flowered.

Lophiola americana (Pursh) Wood. A third Nova Scotia locality on peaty strands of Ponhook Lake (7110). Not abundant at any one place, but scattered for some miles along the lake-shore. Roland adds an additional station at the end of Brier Island, Digby Co.

Habenaria flava (L.) Spreng. Pebbly strand of Medway River at Mill Village (7086) and above Charleston (7103).

This, though not extreme, appears to be true *H. flava* as defined by Fernald (Rhodora xxiii. 147), the lowest leaves being lanceolate and acute rather than elliptic and obtuse, and the spike rather slender and loose. Recorded by Fernald from Yarmouth Co. only.

Corallorrhiza maculata Raf. Dry deciduous woods, above Cameron Lake (7065). Large plants 4.5 dm. tall. "A common species inland and northwards in the province" (Roland); apparently not common in the western counties. Not collected by the Gray Herbarium expeditions south or west of Annapolis Co.

* Salix pedicellaris Pursh. Sphagnous swale north of Middlefield (7098). Though known from Newfoundland, Quebec, New Brunswick and locally south to Connecticut, this species seems never to have been reported from Nova Scotia. The Middlefield material has the leaves glaucous beneath (var. hypoglauca Fernald).

** Alnus serrulata Ait. Thickets on the banks of Cameron (7059) and First Christopher lakes.

Not authentically known east of southwestern Maine, though reported as "rather common in moist ravines and hillsides at Old Fort and probably all along the coast" by W. A. Stearns in his "Notes on the Natural History of Labrador" in Proc. U. S. Nat. Mus. vi. 134 (1883). Stearns's specimens are in the United States National Herbarium; but Mr. C. V. Morton, who has very kindly looked up the matter for me, states that no material of either *A. serrulata* or *A. incana* from Labrador is to be found there. That the former occurs in Labrador is unlikely; St. John's opinion that Stearns's plant was some form of *A. incana* is in all probability correct. (Mem. Victoria Mus. cxxvi. 81 (1922)).

Polygonum coccineum Muhl. f. terrestre (Willd.) Stanford in Rhodora xxvii. 162 (1925). Mucky slough at Cameron Lake (7064); Medway River above Charleston. Reported by Fernald (as *P. Muhlenbergii*) from Yarmouth Co. only.

Polygonum robustius (Small) Fernald in Rhodora xxiii. 147 (1921). Shores of Medway River above Charleston; strand of First Christopher Lake, South Brookfield (7073). Recorded by Fernald from Yarmouth, Digby and Annapolis Cos.; Roland reports it as common in parts of Kings Co.

Potentilla palustris (L.) Scop. Fresh-water marsh, Broad Cove, Lunenburg Co. (7092). Roland reports this species as very common in the central and northern counties, but rare in the southwest. He has collected it at Hubbards, near the Lunenburg-Halifax county line (his no. 38,298) and at Butler's Lake near Gavelton, Yarmouth Co.

Amphicarpa bracteata (L.) Fernald in Rhodora xxxv. 276 (1933). Moist roadside thickets, South Brookfield (7068). Recorded by Fernald from Halifax Co. only and, though common in the north-central area (Roland), apparently rare in the southwest. Roland reports a specimen from Bridgewater, Lunenburg Co., in the Canadian National Herbarium.

Helianthemum canadense (L.) Michx. A large colony on the border of dry, mixed woods, Greenfield (7120; associated with *Aster undulatus*). The only previous report from Nova Scotia appears to be that of Macoun from Kingston, Kings Co. (Cat. Canadian Pl. i. 491)

Viola primulifolia L. Shaded strand of the Medway River above Charleston (7104), of Ponhook Lake near outlet, and of the Mersey River near Liverpool (*Wessman*). Reported by Fernald from Yarmouth and Shelburne Cos. and from Halifax Co. by Macoun and Burgess, Bot. Gaz. ix. 6 (1884) and by Lawson, Trans. N. S. Inst. Sci 1890–91: 98.

Proserpinaca pectinata Lam. In the Medway valley much more common than *P. palustris.* The latter we saw only once, on the muddy river-bank below Mill Village; the former was found at the same place (7076), at other places along the Medway, at Second Christopher Lake, Ponhook Lake and in a wet swale in the woods north of Middlefield.

Lysimachia ciliata L. (*Steironema ciliatum* (L.) Raf.). Banks of the Mersey River near Liverpool (*Wessman*). Not seen by us. Rare in the western counties; reported from Annapolis by Lindsay and from Yarmouth by Fernald, and collected by Fernald & Long near Bridgewater, Lunenburg Co. For the name, see Fernald in Rhodora xxxix. 438 (1939).

Samolus parviflorus Raf. Am. Monthly Mag. ii. 176 (1818). To the few stations recorded by Fernald may be added: muddy shores of the Medway estuary (7075). For the name, see House in Bull. New York State Mus. ccliv. 558 (1924).

Apocynum sibiricum Jacq. f. arenarium (F. C. Gates) Fernald in Rhodora xxxvii. 328 (1935). Many vigorous, sprawling plants on stony upper strand of Ponhook Lake; none in flower or fruit (7111). Seen only here and apparently not common anywhere in Nova Scotia. Represented in the Gray Herbarium from Lunenburg, Hants and Pictou Cos. Fernald's reports of *A. cannabinum* are to be referred here.

Cuscuta Gronovii Willd. On various herbs and shrubs, thickets along the Medway River at Mill Village (7122) and near the outlet of Ponhook Lake. Apparently rare in Nova Scotia: Macoun has a single report from Grand Lake, Halifax Co.; Fernald found it only in the Lahave valley, Lunenburg Co.

** Gratiola aurea Muhl., f. leucantha Bartlett in Rhodora ix. 123 (1907). Forming small pure colonies on the pebbly strand of Ponhook Lake (7112). Reported by Pennell (Monog. Acad. Sci. Philadelphia i. 72 (1935)) from Delaware to eastern Massachusetts. A striking form, the corolla pure white except for a yellow tinge on the inside of the throat.

** Utricularia inflata Walt., var. minor Chapm. Fl. so. U. S. 282 (1860). A single flowering individual in rather deep water of Ponhook Lake (7113). Not previously known east of Hancock Co., Maine. The report (of *U. inflata*) from "Lower Canada (Pursh.)" given by Macoun was an error; Pursh wrote "lower Carolina". Var. *minor* is, of course, the only phase of the species which occurs in the North.

Utricularia subulata L. Margin of the Medway River, Charleston (*Wessman*). Collected by the Gray Herbarium expeditions in Digby, Yarmouth and Shelburne Cos.

Cephalanthus occidentalis L. In abundance at Prof. Wetmore's station at Cameron Lake (7063; see Rhodora xxiv. 204) and at various points along the Medway as far down as Mill Village.

** Solidago sempervirens L. forma **ochroleuca,** n. f., ligulis pallidissime flavis fere albis. Rays very pale yellow, almost white.—Nova Scotia: scattered plants in a salt marsh, Parrsboro, Cumberland Co., Aug. 12, 1941, *C. A. & Una F. Weatherby* no. 7056, type in Herb. Gray. Maine: Isle au Haut, Sept. 12, 1916, *N. T. Kidder* (see Rhodora xix. 20 (1917)).

Similar pale-rayed forms, though far from common, are known in at least two other species of *Solidago*, *S. racemosa* (f. *leucantha* Fernald in Rhodora xx. 172 (1918)) and *S. flexicaulis* (Conn. Geol. Nat. Hist. Surv. Bull. xlviii. 83 (1931)).

Solidago tenuifolia Pursh, var. pycnocephala Fernald in Rhodora, xxiii. 293 (1922). On most lake-shores in the Medway valley (7096); one of the most characteristic species of such habitats.

Aster undulatus L. In a red-pine-bearberry-*Corema* barren (7084) and at border of dry woods, Greenfield. Previously reported from Nova Scotia only in the Lahave valley, where it was collected by Fernald & Long in 1921 and, according to Roland, by Macoun in 1910.

Rudbeckia hirta L. sens. lat. Brooklyn (*Wessman*); not seen by us.

Roland states that the species is common in the northern and central parts of the province and that nearly all the material he has seen belongs to var. sericea (T. V. Moore) Fernald. I did not check this point with regard to Wessman's specimen; but certainly no form of the species is at all generally established in the western counties.

Lactuca hirsuta Muhl. var. sanguinea (Bigel.) Fernald in Rhodora, xl. 481 (1938). Roadsides at border of dry, mixed woods near Lake Rossignol Reservoir (Sixteen-mile Lake) (7100) and Greenfield (7115). Apparently not reported east of Yarmouth and Shelburne counties.

Gray Herbarium

BETULA POPULIFOLIA IN VIRGINIA AND ITS VARIETY LACINIATA IN MASSACHUSETTS

Donovan S. Correll

(Plate 708)

While driving through Fisher's Gap (3061 ft. alt.) in the Shenandoah National Park, Madison County, Virginia, I observed several saplings of *Betula populifolia* growing with the shrubby vegetation which covers the poor, rocky soil at that point. Upon investigating further away from the roadside, a number of saplings were found scattered throughout the area. This is apparently the first report of the occurrence of *B. populifolia* in Virginia and represents the southernmost station known for this species. Gray's New Manual of Botany, 7th edition, gives the distribution of this species as from Prince Edward Island to Delaware, west to Lake Ontario.[1]

A plant of *B. populifolia* var. *laciniata* Loud. was found during the summer of 1941 in an old field in Auburndale, Massachusetts. The individual (Plate 708) consists of a cluster of several sap-

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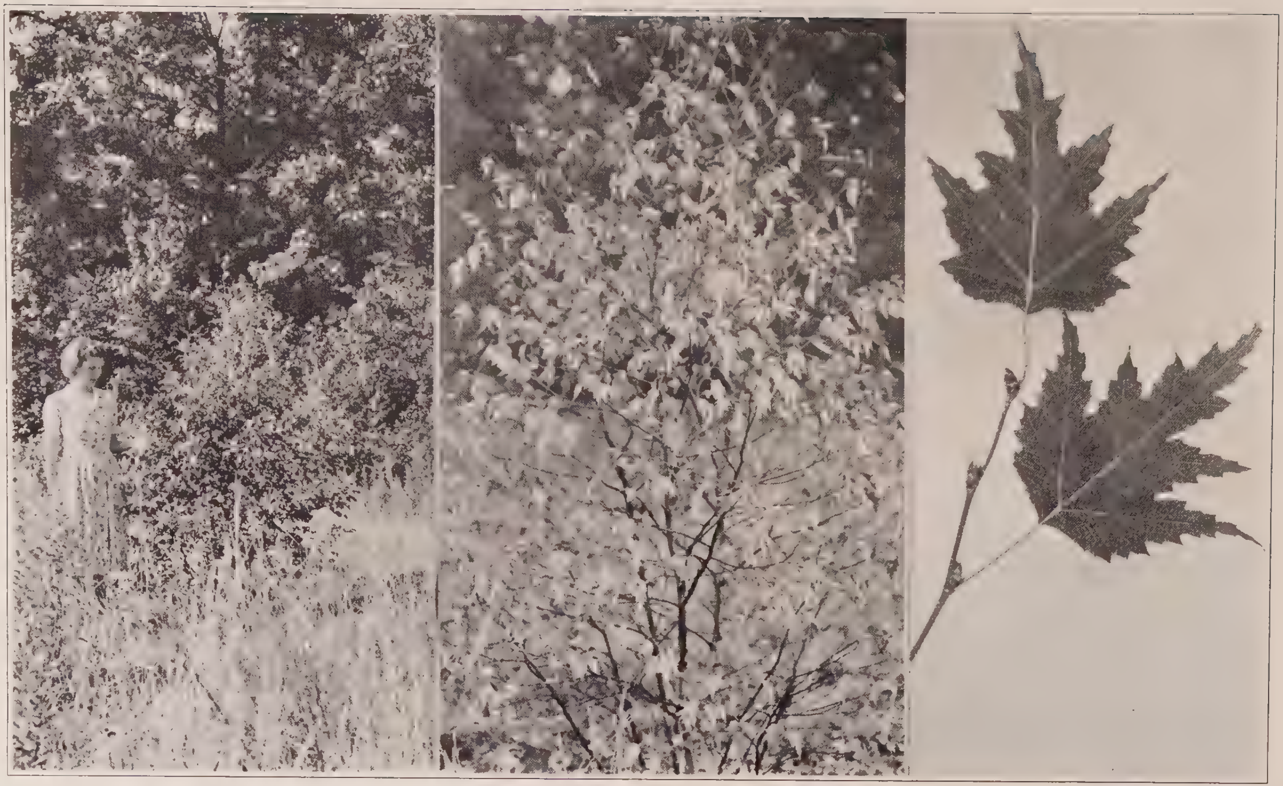
[1] Since this went into type a report of this species in Virginia was published in Castanea, 6: 103, 1941.



BETULA POPULIFOLIA var. LACINIATA in Massachusetts: left, habitat view; center, near-view of plant, partially defoliated; right, close-up of leaves.

lings and basal shoots from a single crown, the tallest sapling being about seven feet high, and is growing in a dense carpet of *Polytrichum commune* L. var. *perigonale* (Michx.) Bryol. Eur.

The old field, which was under cultivation apparently about fifteen years ago, is typical of many of the abandoned fields in this region. It is on the edge of a thick forest at the border of which is a dense stand of *B. populifolia.* A number of shrubs and young trees are scattered over the field, consisting mainly of *B. populifolia, Cornus Amomum, Quercus velutina, Q. alba, Populus tremuloides, Spiraea tomentosa* and *Prunus* sp. The most abundant herbaceous species found in the immediate vicinity of *B. populifolia* var. *laciniata* are *Lechea villosa, Helianthemum canadense, Festuca ovina, Aster vimineus, Solidago canadensis, S. rugosa, S. nemoralis, Phleum pratense, Gnaphalium obtusifolium, Aster cordifolius, Andropogon scoparius* and *Panicum* spp.

Variety *laciniata* is similar to the typical form of *B. populifolia* except for its deeply incised-laciniate leaves. The leaves, which are deltoid-ovate in outline, are truncate to broadly cuneate at the base and are deeply cut (to about two-thirds of the distance to the midrib) into three to seven lobes. The lobes are long-attenuate at the apex and are sharply and irregularly serrate-laciniate on the margins.

Variety *laciniata* has been known from cultivation since it was originally described in 1838, and perhaps before that time. However, so far as I know, it has never been reported as growing in the wild state. It is doubtless a mutation and should be looked for in nature.

Specimens from the above two stations have been placed in the Gray Herbarium and the Duke University Herbarium.

Botanical Museum, Harvard University.

The Scarcity of pink-flowered Gentiana Porphyrio.—In Bull. Torr. Bot. Club, lxviii. 662 (1941), arguing that the name *Gentiana Porphyrio* J. F. Gmelin, substitute for *G. purpurea* Walter, is rightly applied to the plant which commonly has deep azure-blue corollas, the plant I had called *G. Stoneana*, Dr. R. T. Clausen said "The most notable variation is in the color of the flowers. These vary from deep blue to pink. I have seen the pink phase in the garden of Mrs. J. N. Henry, Gladwyne, Pennsylvania. These plants came originally from near Wilmington, North Carolina." From this phrase one might, with good reason, infer that its author knew "plants" with pink corollas. Consequently, yielding to Dr. Clausen's persuasion, I referred in Rhodora, xliv. 151 (1942), to "The discovery by Mrs. J. Norman Henry near Wilmington, North Carolina, as reported by Dr. R. T. Clausen in Bull. Torr. Bot. Cl. lxviii. 662 (1941), of pink-flowered plants growing with the typical azure-flowered plant."

Mrs. Henry, however, writing on May 21, 1942, corrects a misunderstanding.

> "The fact is as follows:
>
> In 1938 I ran across a large area that was dotted liberally with *Gentiana porphyrio*—the common blue type. As is my custom on finding a large group of any plant, I began to search for an albino. I had no luck with the pure white but I did find the pink . . . A long and careful search [any one knowing Mrs. Henry can be sure that the search was a thorough one] revealed that this was the only one of its color. There were no intermediate shades.
>
> The plant was a young one with but one slender flower-stalk. I think its age could not have been more than three years. It has been growing in a pot in a cold frame ever since. This spring [1942] it had nine stems capable of flowering, so I ventured to divide it in two. I am glad to say that both plants are now thriving, one in a pot and one outside."

It is evident that I was in error in referring to Mrs. Henry's having found "plants" with pink flowers.—M. L. Fernald.

MISINTERPRETATION OF ATLANTIC COASTAL PLAIN SPECIES

M. L. Fernald

The Atlantic Coastal Plain of the United States, with its western extension, the Gulf Coastal Plain and its Mississippi Embayment, forms one of the most natural biogeographic areas of the country. Its position and extent are clearly shown in many of my own papers, as, for instance, in Rhodora, xxxiii. 26 (1931). Pennell on some of his published maps clearly outlines it; and it is recognized by W. T. McLaughlin in Ecological Monographs, ii. 339, fig. 1 (1932). It is, of course, definitely described and shown on maps in all reliable treatises on the geology and physiography of North America, and books which every phytogeographer should have at his right hand are perfectly lucid in showing its limits and in discussing it: such books as Bowman's *Forest Physiography* and Fenneman's *Physiography of the Eastern United States.*

Nevertheless, many papers are published by botanists living far from the real Coastal Plain in which is apparent an amazing misinterpretation of its limits and of its very distinctive flora. Geologically and physiographically the Atlantic and Gulf Coastal Plain is the relatively flat marginal area which was covered by the border of the Cretaceous and then by the Tertiary seas; covered so deeply that the more ancient rock-formations, such as characterize the Piedmont and mountainous areas, were completely buried and show at the surface only at the inner edge of the Cretaceous and Tertiary beds. At the inner margin of the Atlantic Coastal Plain, which varies in breadth from only a few miles on Cape Cod, to from 25 to 65 miles in New Jersey, 100 to 125 miles in Virginia and the Carolinas, and up to 150 miles in Georgia, flat tongues of land, evidently ancient coves and inlets, covered with typical Coastal Plain deposits and vegetation, extend back among the Piedmont hills of hard and pre-Cretaceous rock. Where the Cretaceous or Tertiary marine deposits contain abundant fossil mollusca and bony skeletons the soils are highly calcareous. Where the deposits are of sand or clay they are commonly acid; and in areas of abundant shell-deposits millions of years of constant leaching have resulted in acid superficial soil.

The striking feature of the Coastal Plain (at least from New Jersey to Virginia), besides its low altitude, relatively shallow sculpturing and essential monotony of landscape over vast areas, is this abrupt change from acid to basic soils; a flat area, leached for 25,000,000 or more years and consequently supporting an oxylophytic vegetation, instantly giving way, where a stream has cut down a few feet into the marl-beds, to a pronounced calcicolous vegetation. Where lime is readily available the calcicolous plants of the Piedmont, the Appalachian Upland or even of the Mississippi Basin, long ago finding the region, have moved in: such characteristic species as *Ulmus fulva* (for map

see Hough, Handb. Trees, 189 (1907)), *Juglans cinerea* (l. c. 51), *Ptelea trifoliata* (l. c. 301), *Euonymus atropurpureus* (l. c. 323), *Acer Negundo* (l. c. 337), *Hydrangea arborescens, Menispermum canadense, Hexalectris spicata* (see Rhodora, xxxix. 343, map 18), *Leersia lenticularis* (l. c. 349, map 22), *Carex Grayii* (l. c. 343, map 19), *Trifolium reflexum* (l. c. xliii. 503, map 5), *Arabis canadensis, Thaspium barbinode, Campanula americana* (l. c. map 7), *Lobelia siphilitica* (see McVaugh, Rhodora, xxxviii. 280) and many scores more, with local pockets supporting *Hybanthus concolor, Athyrium thelypterioides, A. pycnocarpon* and, on hardened shell-marls, *Pellaea atropurpurea.* These and hundreds of other continental or inland types obviously should not be called primarily Coastal Plain species. Neither should the many plants of circumneutral to acid soils of the interior, which overlap upon the Coastal Plain: such species as *Pinus echinata* (see Hough, 15), *P. virginiana* (l. c. 17), *Carya alba* (l. c. 63), *Salix discolor* (l. c. 93), *Populus grandidentata* (l. c. 111), *Quercus palustris* (l. c. 143), *Rhus typhina* (l. c. 307), *R. Vernix* (l. c. 311), *Oxydendrum arboreum* (l. c. 373) and the host of shrubs and herbs which accompany them.

The true Coastal Plain plants are the species restricted to or primarily developed upon that distinctive area, mostly without but sometimes with a few and remote upland stations. These and their probable movement out from the ancient Appalachian (and Ozarkian) cores of the continent have been much discussed[1]; that problem need not now specially concern us. The extensive and very characteristic flora typical of the Coastal Plain contains many hundreds of thoroughly distinct species: such trees as *Pinus palustris* and *serotina, Taxodium distichum* (for map see Hough, 39), *Smilax laurifolia* and *Walteri, Carya aquatica* (l. c. 55), *Quercus laevis, virginiana* (l. c. 181) and *cinerea, Asimina parviflora, Persea palustris* (l. c. 219), *Xanthoxylum Clava-Herculis* (l. c. 299), *Cyrilla racemiflora, Ilex vomitoria* (l. c. 317), *Nyssa aquatica* (l. c. 367), *Rhododendron atlanticum, Leucothoe axillaris, Lyonia lucida, Zenobia pulverulenta* (see Rhodora, xlii. 378, map 16), *Vaccinium crassifolium* (l. c. map 12), *Fraxinus caroliniana* (Hough, 387) and scores of other trees and shrubs.

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[1] See especially Fernald: *Specific Segregations and Identities in some Floras of Eastern North America and the Old World.* Rhodora, xxxiii. 25–63—Contrib. Gray Herb. xciii (1931).

These are accompanied by a tremendous series of herbaceous plants: *Sagittaria Weatherbiana* (see Rhodora, xxxix. 327, map 5), *Panicum hemitomon* (l. c. 343, map 14), *aciculare* (Hitchcock, Man. 622, fig. 1292), *ensifolium* (l. c. 646, fig. 1410), *leucothrix* (l. c. 632, fig. 1340), *Wrightianum* (Rhodora, xxxix. 327, map 13) and dozens more, *Sacciolepis striata* (Hitchc. Man. 688, fig. 1548), *Axonopus furcatus* (l. c. 573, fig. 1197), *Ctenium aromaticum* (Rhodora, xxxix. 327, map 11), *Manisuris rugosa* (Hitch. Man. 763, fig. 1687), *Eleocharis tricostata* (Rhodora xli. 471, map 4), *tortilis* (Svenson, Rhodora, xxxix. 246, map 15) and *vivipara* (l. c. 242, map 12), *Scirpus divaricatus* (Fernald, Rhodora, xxxix. 327, map 4), *Rhynchospora pallida* (l. c. xlii. 378, map 14), *R. Torreyana* (l. c. xxxix. 478, map 32) and two dozen more, *Cladium jamaicense*, numerous *Carices*, *Xyris flexuosa* (*arenicola*), *ambigua*, *platylepis*, *fimbriata* and *Curtissii*. *Eriocaulon decangulare* and *compressum*, *Juncus abortivus* (l. c. 349, map 28), *caesariensis* (l. c. 327, map 1), *Elliottii*, *Longii* and others, *Tofieldia racemosa*, *Zigadenus glaberrimus*, *Aletris aurea*, *Hypoxis leptocarpa* (l. c. map 7), *Zephyranthes Atamasco*, *Burmannia biflora* (l. c. xli. 471, map 7), *Habenaria nivea*, *integra* and *cristata*, *Calopogon pallidus* (l. c. xlii. 378, map 13), *Arenaria caroliniana* (l. c. xxxix. 349, map 29), *Drosera filiformis* (l. c. xxxiii. 55, map 29), *Micranthemum umbrosum* (l. c. xxxix. 327, map 8), *Lobelia elongata* (McVaugh, Rhodora, xxxviii. 286, fig. 8), and hundreds more. THESE REPRESENT THE ATLANTIC COASTAL PLAIN FLORA.

The true members of the Atlantic Coastal Plain flora are rarely found off the Coastal Plain; it is they which give individuality to the region. Only a very small number of them occur in the region of the Upper Great Lakes: *Panicum verrucosum* (Hitchc. Man. 682, fig. 1537), *lucidum* (l. c. 630, fig. 1333) and *mattamuskeetense* (l. c. 627, fig. 1317), *Eleocharis melanocarpa* (Svenson, Rhodora, xxxix. 270, map 22), *Psilocarya scirpoides* and *nitens*, *Fuirena pumila*, *Rhynchospora corniculata* and some others. Unfortunately, however, it is coming to be the fashion for some botanists of the north-central states to assume that almost any plant occurring east of Lake Michigan, and especially from east of the Alleghenies or the uplands of central-western New York and Pennsylvania, is a Coastal Plain species; and their papers on "Atlantic Coastal Plain Plants in the Flora of" Here-and-There record common Canadian, northern Piedmont, transcontinental and even circumboreal species as belonging primarily to the "Atlantic Coastal Plain." In the cases where such plants actually are on the true Coastal Plain, they are there merely as part of a broad continental range and their presence there is of no dramatic importance; and when the authors cite as "Atlantic Coastal Plain" types plants which occur in Britain, Sweden, Russia, Siberia, Alaska, Washington, Idaho, Saskatchewan, the Hudson Bay Region, the Laurentide Region, Labrador and Newfoundland (or in some of these areas) one becomes quite discouraged over the future of phytogeography in the hands of such wishful thinkers.

Somewhat against my own will I have yielded to the insistence of others who have been troubled by the same loose designation of wide-ranging inland plants as significant species of the Atlantic Coastal Plain and with me have felt that, in the interest of more exact phytogeography, such errors should be noted. Only some of the cases which have recently come to my attention are here recorded; they are sufficient to indicate where clearer thinking and more accurate tabulation are important.

Lycopodium inundatum. Originally described from Europe, typical *L. inundatum* is characteristic of acid peats and wet sands of that continent and of cool-temperate to Canadian North America: abundant in Newfoundland (including the highest tablelands) and the Maritime Provinces of Canada, thence across Quebec and northern Ontario to Thunder Bay District (north of Lake Superior), it also occurs in Alaska, British Columbia, Washington, Oregon and Idaho. In the East, typical *L. inundatum* extends south to southern New England, southern New York, New Jersey, Pennsylvania, the Allegheny Mts. of Virginia, West Virginia, northern Ohio, northern Indiana, northern Illinois and Minnesota. Of the more than 2,000,000 square miles of territory in Europe and North America in which it is known less than 10,000 square miles are on the Atlantic Coastal Plain, 1,990,000 square miles inland from the Coastal Plain or in Pacific America or Europe.

Muhlenbergia uniflora. Very abundant in acid peats, sterile meadows, and on damp shores, etc., from Newfoundland and the southwestern part of the Labrador Peninsula to Thunder Bay District (north of Lake Superior), Ontario, south to Nova Scotia, southern New England, Long Island, New Jersey, Michigan and Wisconsin; less than 1 *per cent* of its area being on the Atlantic Coastal Plain. Had the map in Ecol. Mon. l. c. 345, fig. 10, contained more dots in Newfoundland, Nova Scotia, northern New England, and some on the Labrador Peninsula, in Quebec, the Adirondack region and the Thunder Bay District, the essentially boreal range would have come out.

STIPA AVENACEA. Wide-ranging in sufficiently dry and sterile soils (Hitchcock says "Dry or rocky open woods") through most of the eastern United States, northward to Massachusetts, New York and Michigan. Dry open woods abounding on the Coastal Plain, it naturally occurs there, just as it does "on top of Buzzard Mountain" in interior Virginia, on dry hills near Biltmore in the Carolina Mountains, on Pine Mountain, Georgia, or on the Cumberland Plateau or on "dry ridges, near Knoxville", Tennessee.

ECHINOCHLOA WALTERI, growing in basic waters and sloughs, naturally enough is along the coast, especially on somewhat brackish tidal shores; it rarely extends inland on the Coastal Plain, but it follows tidal shores within the Piedmont area; and in appropriate habitats occurs inland in New York, Ohio, West Virginia, Kentucky, Indiana, Michigan, Wisconsin, Illinois, Iowa and Missouri. It is as much *off* as *on* the Coastal Plain. The map in Ecol. Mon. ii. 341, fig. 4 (1932) gives stations only along the Atlantic margin and from the lake region of New York to Wisconsin; Hitchcock, Man. fig. 1560, has a more accurate picture of the range.

ELEOCHARIS PAUCIFLORA, var. FERNALDII. Svenson's map in RHODORA, xxxvi. 384 (1934) gives a vivid picture of the range: Newfoundland and adjacent Labrador Peninsula to James Bay and to Lake Nipigon, Ontario, south to Cape Breton Island, Nova Scotia, calcareous ledges of northern Maine, northernmost New Hampshire (north of the White Mountains), mountains of northeastern Vermont, northern and western New York, northwestern Pennsylvania, northern Indiana, northern Illinois and northern Iowa. Its inclusion in Papers Mich. Acad. Sci. Arts and Lett. xxvii. 41 (1942) must have been due to the misconception which classed several other wide-ranging species as of the Atlantic Coastal Plain. *E. pauciflora*, found nowhere on the Coastal Plain, occurs in northern and cool areas of Eurasia, in Greenland, and in western North America from Great Slave Lake and the Canadian Rocky Mts. south to New Mexico, Arizona and California; also in the Andes. It is typically circumboreal, with an embarrassing Andean relationship.

E. ROSTELLATA is halophytic; consequently, having found the sea-margin of the Atlantic, it follows it (from Nova Scotia to the Greater Antilles). Its largest region, however, is in alkaline areas from southwestern Canada to Oklahoma, Texas, Mexico and southern California (see Svenson, Rhodora, xxxvi. 385, map 2). There it is of broad continental dispersal. On the Atlantic Coastal Plain it is merely where the saline Atlantic waters lap the shore! That is, however, simply because it is a rather typical American halophyte.

Hemicarpha micrantha. The map in Ecol. Mon. l. c. fig. 2 indicates Atlantic Coastal Plain stations on Cape Cod, Long Island, possibly New Jersey and Maryland, and in southern Florida and Alabama; but it shows nothing from Maine, central New Hampshire, eastern New York, Ontario, Ohio, Virginia, central Kentucky, Nebraska, Kansas, Wyoming, Colorado, New Mexico, eastern and northern California, Oregon, Washington, the tablelands (up at least to 3000 feet) of Mexico and Central America, to say nothing of 25 degrees of latitude in South America, all of which would have materially changed the picture (for more accurate map see Friedland, Am. Journ. Bot. xxviii. 858 (1941)).

Rhynchospora fusca, originally described from Sweden, England and Italy, characterizes bogs, wet peats and wet sands of Europe, just as it does in North America, from Newfoundland to Algoma District, Ontario (often ascending to mountain-ponds at 1500–3000 feet). Southward it reaches Delaware and Michigan. It is a typical boreal plant.

R. alba. Still more boreal—circumboreal, found in Europe and Siberia; and in America in many areas from Alaska to California and Idaho; and from northern Ontario to southeastern Labrador and Newfoundland, thence south to Minnesota, Illinois, Indiana, Ohio, Pennsylvania, the Carolina Mountains, New Jersey, Long Island, New England and Nova Scotia. A typical circumboreal plant of acid peats, etc.

Carex exilis. Eastern Labrador to James Bay, south to Newfoundland, Nova Scotia, Maine (very local), Massachusetts, Rhode Island, Delaware, New York, southern Ontario and Michigan. On the Coastal Plain only in New Jersey and Delaware, as an intrusion from the north, like so many species which were clearly understood by the late Witmer Stone (Pl. So. N. J. 49), a biogeographer whose caution, accuracy, clear thinking and modesty it would be a comfort to see more frequently emulated: such plants as *Lycopodium inundatum* (see above), *Schizaea pusilla* (for map see Rhodora, xxxv. 86, map 7), *Potamogeton confervoides* (for map see Fernald, Mem. Am. Acad. xvii. 33, map 1), *Scirpus subterminalis*, *Carex limosa*, *Eriocaulon septangulare* (see below), *Juncus articulatus* (see below), *J. pelocarpus* and *Aster nemoralis* (for map see Rhodora, xxii. 94, map 3).

C. Richii. When Mackenzie elevated this plant to specific rank (Bull. Torr. Bot. Cl. xlix. 362 (1922)) he enumerated all the specimens examined, all (I believe) from inland beyond the Coastal Plain.

ERIOCAULON SEPTANGULARE. A famous and often cited trans-Atlantic species (see Proc. Internat. Congr. Pl. Sci. ii. 1505, map 40). Originally described from western Scotland, the plant is known in various parts of Ireland. The map referred to could now be somewhat extended by dots in the mountains of Virginia and some from farther north; and the inclusion on map 20 of the paper in Ecological Monographs of all of Newfoundland, Nova Scotia, New Brunswick, the Laurentide region, etc. and the omission of the dot in southern Georgia would help clarify the situation.

JUNCUS GREENEI, to be sure, is on the Coastal Plain of Massachusetts and Long Island, becoming very local in New Jersey, but its great development eastward is on the sterile and rocky Piedmont area and on the mountains from Nova Scotia to eastern New York. Although it abounds on sand dunes and plains mostly north of the Coastal Plain, it is a regular inhabitant of arid siliceous and granitic hills and lesser mountains of southern and southwestern Maine and adjacent New Hampshire, the following data taken from labels before me: "granitic soil, top of Mt. Waldo, Winterport, and cliffs, Indian Hill, Belfast"; "ledgy summit of Mt. Megunticook, Camden", "dry hilltops, East Auburn"; "very common on dry mountain sides, Cornish"; "ca. 3500 ft.", Mt. Washington; "Mt. Washington Carriage-road, 3800 ft."; "summit of Mt. Belknap, 2259 ft. alt., Gilford"; "summit of Pack Monadnock". No one who has stood on these New England mountain-tops or who has followed the carriage-road, hewn in solid rock, to 3800 feet on Mt. Washington, has imagined himself on the "Atlantic Coastal Plain".

JUNCUS BALTICUS, var. LITTORALIS. *J. balticus*, from its specific name obviously described from northern Europe, is a polymorphous, amphigean, more or less halophytic type, separated on not too convincing characters into many so-called geographic varieties. The broad range of the species includes alkaline regions of much of the cooler part of the Northern Hemisphere, with an extension down the Andean region to Patagonia. Var. *littoralis* occurs from Labrador to Hudson Bay and northwestward at least to the Mackenzie Basin, with extensions southward to southern New York, Pennsylvania, the Great Lakes States, Nebraska, etc. Stone did not include it in his *Plants of Southern New Jersey*. Probably not one-fourth of 1 *per cent* of its southeastern extension in North America is on the Atlantic Coastal Plain.

It is needless (I fear futile) to discuss in detail scores of additional cases: such amphigean plants as *Juncus articulatus* and *Drosera intermedia;* or such eastern American ones as *Melampyrum lineare*, var. *latifolium*, clearly shown by Pennell (Scroph. E. Temp. N. A., map 148) as chiefly inland from the Coastal Plain, with a long tongue following the Alleghenies from Pennsylvania to Georgia, or *Gerardia paupercula* which is characterized by Pennell (see his map 114) as follows: "This species occurs wholly in glaciated territory, excepting for the occurrence in southeastern Pennsylvania . . . and . . . the unglaciated area of Wisconsin". He knew better than to call it a Coastal Plain type.

It is evident that too many botanists with limited outlook over the continent or the world have made the mistake of thinking in ecological rather than phytogeographic terms; to them any plant of sphagnum-bogs, peats and acid sands, as well as of salt marshes, would seem to be a plant of the Atlantic Coastal Plain. Until they study and understand the real Coastal Plain and its really distinctive flora such groundless but well-intended generalizations about them will be wholly misleading. Unfortunately, as I have been forced to write before, such work "contains so many assumptions that it must be classed as another addition to our too extensive mass of publications in which the tremendously interesting facts of distribution are replaced by vague and unsupported statements. That so many authors dealing with phytogeography are content to draw their deductions from inaccurate data is amazing, for, in this subject as in all others, as Byron long ago asserted, 'truth is always strange,—stranger than fiction'." Still more unfortunately, "errors once born never die but, on the contrary, by others not situated to know the facts are continually mistaken for the truth and consequently perpetuated," especially when they emanate from distinguished universities and academies. Erroneous matter thus formally published can not be blacked out!

Nematode Infection in Poa.—On the examination of plants of *Poa pratensis* from the matted mossy sward of an old hill pasture near the town of Antigonish, Nova Scotia, the variation in the size and appearance of the spikelets in the same panicle was found to be due to infection of some with nematode worms. The larger and greener spikelets had the grains filled with soft material composed of numerous eggs and larvae. The lemmas of such infected spikelets were 4.5–5.0 mm. long with 5 distinct and generally 2 or 4 additional less distinct nerves and were broad enough to completely enclose the palea and the long (3.0–4.5 mm.), smooth, purple body representing the caryopsis. When all florets of the spikelet were infected the spikelet was 5.5–6.5 mm. long. The palea in some was normal, but in others it was represented by a 1- to several-nerved scale lacking in ciliation and, in all cases, quite free from the caryopsis. The glumes, particularly the second, were 3-nerved.

Normal spikelets are 3–5 mm. long with lemmas 3 mm. long, distinctly 3-nerved with 2 additional fainter intermediate nerves. The grain is plump, broad-elliptical, 2 mm. long, farinaceous, brownish and somewhat adherent to the palea.

In plants severely parasitized, the panicles are very much reduced in size with the few spikelets on stiff and short branches. Such plants compare fairly well with specimens of *Poa costata* Schumacher collected by members of the Gray Herbarium Expedition in Nova Scotia in 1920 and 1921 (Rhodora **23:** 133, 231, 1921). A dissection of specimens in the National Herbarium of Canada, however, showed all to be infected with the nematodes and to possess morphological characters essentially the same as in infected spikelets of *P. pratensis,* as mentioned above. Although it cannot be said with certainty, it appears quite probable that these plants that have been passing as the rather rare *P. costata* of the Baltic, Newfoundland, Prince Edward Island and Nova Scotia may be, in reality, diseased states of the common *P. pratensis* or some other local species. A parallel case is frequently met with in *Agrostis tenuis* Sibth., the disease-modified plants having been given distinct specific or varietal names in the past (see Philipson, Jour. Bot. LXXIII: 65–74, 1935).—W. G. Dore, Dalhousie University, Halifax.

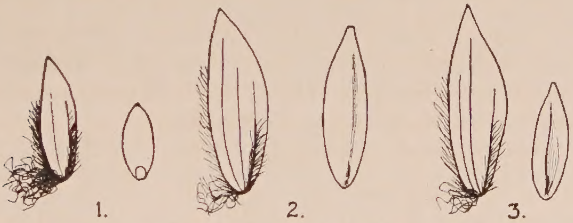

Fig. 1, lemma and caryopsis of normal spikelet of P. PRATENSIS. Fig. 2, lemma and caryopsis of infected spikelet from same panicle. Fig. 3, lemma and caryposis of P. COSTATA (infected). All figures × 5.

Some New Records of Spermatophytes from Missouri.—During the last two collecting seasons, a number of Flowering Plants which appear to be new records for the state have been added to the Herbarium of the University of Missouri. For purposes of record, therefore, publication of these collections seems desirable.

Falcaria sioides (Wibel) Asch. (*Falcaria vulgaris* Bernh.), growing in considerable abundance along a fence-row in bottomland soil on the roadside between Hartsburg and Welton, Boone County, was first observed and collected (VII/20/40) by Mrs. Grace Ernst Miller whose identification I have verified at the Gray Herbarium. It may well be more than a coincidence that this plant, native to central Europe, has become established in a neighborhood where many of the early settlers came from Germany. In this locality in Missouri the plant appears to have been established for a considerable period of years.

Veronica didyma Ten., growing on moist soil of bottomland woods, was collected on the Drury Wildlife Refuge, Taney County, by Mr. D. Spencer (III/27/41). My identification was verified personally at the Gray Herbarium.

Liatris scariosa (L.) Willd., f. *Benkei* Macbride, the rare white-flowered form of this Liatris, was collected by myself (IX/17/40) in an upland prairie relict, paralleling the tracks of the Burlington and Wabash Railroads and State Highway 22, about three miles east of Centralia, Audrain County. Despite further diligent search of many prairie relicts in central Missouri, no other white-flowered plants of this species were found, although numerous white-flowered individuals of *Liatris pycnostachya* Michx. have been observed annually in the same general area.

Carduus nutans L., found growing as a weed in a field near Palmyra, Marion County, was collected by Mr. C. G. Tarleton (VI/9/41). For verifying my determination, I am greatly obliged to Mr. C. A. Weatherby.—William B. Drew, University of Missouri, Columbia, Mo.

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